

**September 23, 2010 Planning Meeting
NIDIS Pilot Drought Early Warning System in California
NOAA Southwest Fisheries Science Center, Room 370
3333 North Torrey Pines Court, La Jolla, CA**

A one-day meeting of primarily Federal agency representatives and key partners was held to plan the initial activities of a NIDIS (National Integrated Drought Information System; www.drought.gov) pilot drought early warning system in California. NIDIS Director Roger Pulwarty reviewed National Integrated Drought Information System (NIDIS) concepts, governance, activities, the drought portal, and results of the recent NIDIS executive committee meeting. He provided an overview of the importance of pilot drought early warning systems to the implementation of NIDIS including the expectations. In Year 1, the Pilot Drought Early Warning Systems concentrate on the collection of requirements from decision makers to be served, and designing the pilot early warning system around these specific needs. Priorities lie with assessment of user organization capacity and identification of monitoring gaps as well. In Year 2, the Pilot Drought Early Warning Systems concentrate on implementing the prototype early warning system, and documenting successes and insights for improvement. The overview on NIDIS was followed by a description by James Verdin of the process used to develop a Pilot Drought Early Warning System in the Upper Colorado River Basin, how the pilot activities were focused based on identification of a subset of critical issues, the implementation process and lessons learned. Chat McNutt then provided an overview of the evolution of NIDIS Pilot Drought Early Warning System in the Southeast, how the pilot is being organized, strategies for engagement, how and why the pilot activities will be focused as well as lessons learned. All three presentations resulted in healthy discussions that clarified many issues and addressed participant questions. Copies of the three power point presentations will be available for download at www.drought.gov/portal/server.pt/community/calif.

After the three NIDIS introductory presentations, Anne Steinemann led structured round table discussions of existing drought information activities and drought information needs in California. Topics of existing activities and of needs included:

- Regional scale hydrological modeling to look at the state of California and water availability, driving forces for habitat changes, and incorporate climate change into this work.
- Better use of groundwater during drought (better understanding of conjunctive use of surface and groundwater), how does drought increase groundwater use and what are implications to subsidence, sea water intrusion, etc.
- The role of the Delta in creating water supply issues (both natural and regulatory), how can NIDIS reduce conflict surrounding the Delta issues.
- Better ways of quantifying low flows.
- USACE has some flexibility with their flood control diagrams but not as much as USBR would like.
- Water demand information on how agriculture, municipal demands will change in the future.

- Characterize drought in CA because the US Drought Monitor (USDM) does not. Mostly the USDM is good at showing dry land farming effects, which is a small aspect of agriculture in CA.
- Water demand information that is easy to access. Need to access data sets that are climate relevant, unified data formats that can be incorporated into a modeling framework.
- Urban water management plans (e.g. southern CA) are required to demonstrate water authorities can provide water in a drought regime (through a drought plan). Need more realistic scenarios than just the 1988 or 1987 as severe droughts of record.
- High-resolution streamflow models and affects on fisheries.
- Better information about water demand, water availability needs by sector (when does a sector become stressed because of a lack of water availability).
- Climate forecasts for flood in the fall for emergency management preparedness.
- Winter water supply climate forecasts
- Provide information for growers and water districts to use for irrigation scheduling.
- Focus on critical time for ag decisions: April/May.
- Growers want to know what their allocation will be based on expected conditions (forecast comes through USBR from DWR). The earlier the inflow forecast the better (start in Feb. go to May). Deliveries are based on the 90% exceedence value, which is quite conservative.
- Understanding of anomalies (wind, precip, temp) that will significantly affect the snowpack.
- Improved forecasts to estimate how much snow is above monitoring networks
- Better forecasts of water demand season such temperature during growing season would help inform farmers making decisions about what crops to grow.
- Crop type affects demand and seasonal outlooks would help understand what demand might look like.
- Indicators for estimating what Delta inflow given reduced Delta input will affect southern CA water supply.
- Water quality information, not just flow but how flow affect water quality.
- Spectrum of monthly, biweekly, weekly and daily streamflow forecast plus trend
- Better SWE or snow information in general, late season snow course information
- Probabilistic information to improve reservoir operations (more than just the 5 bins or scenarios (water year types) that are currently used: dry-warm, cold-wet, etc).
- Information that provide better certainty or reliability on getting their water.
- Good forecast on flow for August/September would be helpful
- A long range water supply forecast (>5yrs)
- Better data or placement of monitoring sites in better locations
- Improved communicating, analysis and integration of data
- Need better understanding of what groundwater indicators or data represent
- Accurate precipitation data is critical
- Larger scale monitoring schemes for better intercomparisons
- More groundwater monitoring wells (influenced by climate only). Currently only have two for the whole state.

- Impact of drought on affect riparian communities
- Stream temperature gages at each stream gage
- PET-AET for information on what's going on with plant stress
- Radiation as an extremely important variable that is currently not quantified well.
- How frequency, intensity, duration of drought may change in the future
- Water budget data in one location, or integration of the water budget data
- Enhanced communication of drought issues to policy makers
- Better predictions of when ongoing drought will end
- Improved characterization of urban water demand issues and definition of drought in a state that moves water to the extent CA does.

Once the group had a clear understanding of both the on-going drought information activities and the drought information needs within the state of California, the focus shifted to identify criteria for selection of possible Pilot Drought Early Warning System projects. All participants submitted ideas for criteria. The resulting final list of criteria below was developed based on a lengthy discussion of what each criterion implied and an effort to cull duplicate ideas.

- Information bottleneck
- National importance
- Institutional bottleneck
- Storage-rich
- Fish
- Local commitment and support
- Sustainability
- Existing resources
- Complex but feasible
- Different from other pilots
- Generalizable lessons
- Issues of plumbed systems
- Agriculture
- Wildfire
- Energy
- Political clout
- Underserved populations, communities
- Water quality connection
- Snow/rain influences
- Tourism and recreation
- Transboundary contrasts
- Population affected
- Potential impacts

The criteria brainstorming effort was followed by development of a list of potential geographic and sectoral areas for a NIDIS Pilot Drought Early Warning System in California. Once again all participants submitted ideas for sectors or locations and a group discussion was used to refine the suggestions, resulting in list of ten potential areas to focus a NIDIS Pilot Drought Early Warning System in California.

- Southern California - urban
- Sierra Nevada
- Klamath
- Amargosa River Basin
- North Bay Counties
- 10 Bay Area Counties
- Napa
- Ivanpah
- Central Valley
- Coastal Basins
- Desert Areas (Colorado; Mojave)

The next step in the effort to identify candidate areas to focus a NIDIS Pilot Drought Early Warning System in California was to systematically evaluate the ten possible pilot areas in terms of the list of criteria. After a roundtable discussion of the relative attributes of each area, the list was narrowed to five areas:

- Southern California - urban
- North Bay Counties
- Central Valley
- Sierra Nevada
- Mojave

A voting process was then conducted. Each individual was given six points that they could allocate among one, two, or three possible areas, representing their top choices. For instance, if an individual had a clear first, second, and third choice, then those areas would receive three points, two points, and one point, respectively. If they preferred two areas equally, and had no clear third choice, then those two areas would each receive three points, and so forth. The voting was conducted in confidence. The results were tallied, and the rankings of the top three areas were consistent both in terms of number of individuals voting for the area and the total number of points received by the area. The top three areas were

- Southern California - urban
- North Bay Counties
- Central Valley

The group then engaged in a discussion of feasibility of the three areas. Southern California – urban was recognized as not only very different than any of the existing NIDIS Pilot Drought Early Warning System activities but also very different than the other two potential areas of focus. The North Bay Counties was noted to represent an opportunity to work across agriculture, fish, storage, and had significant existing resources. Central Valley was discussed as too big and potentially not tractable with NIDIS insertion into the process

risking a lack of impact. The discussion suggested that the Central Valley be more focused on some combination of the Sacramento Valley and the adjacent Sierra Nevada. It was also agreed without too much debate to add the Klamath to the shortlist since excluding the Klamath would probably add more debate in terms of why it was not included to subsequent deliberations that will lead to making final decisions on where and what should be the focus of the NIDIS pilot drought early warning system in California.

Action items coming out of the meeting were:

- During the December 6-8 time period, hold a second phase scoping workshop to refine and focus the Southern California – urban NIDIS pilot drought early warning system activity in California.
- A subset of participants located in Sacramento would work together to provide better definition for a ‘Sacramento Valley linked to adjacent Sierra Nevada’ NIDIS pilot drought early warning system activity in California.